

English translation of the amended sheets of International Preliminary  
Examination Report  
25CLAIMS

1. Irradiation device for a target (12), particularly an area of the human body, by a charged hadron beam (4), this beam being produced by means of generating a charged hadron beam, this device being  
5 characterized by the fact that it comprises:

- corpuscular optics means (14, 16, 18, 20), designed to make the transverse density of the charged hadron beam uniform, along at least one direction perpendicular to the trajectory of  
10 this charged hadron beam, and

- means (6, 22, 24; 10, 22, 24) for the three-dimensional control of the irradiation of the target by this charged hadron beam,

in which the three dimensional control means  
15 include:

- means of adjusting the energy of the generated charged hadrons and  
- scanning means capable of displacing the charged  
20 hadron beam to make it scan the target along a narrow substantially rectangular band, and capable of causing the centre of the narrow band to follow a median line while lengthening or shortening this narrow band in order to follow the contours of the target.

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2. Device according to claim 1, in which the corpuscular optics means comprise at least one non-linear corpuscular optics lens.

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3. Device according to claim 1, in which the corpuscular optics means include two non-linear corpuscular optics lenses designed to make the transverse density of the charged hadron beam uniform, along two directions perpendicular to each other and to the trajectory of this charged hadron beam.

4. Device according to either claim 2 or 3, in which each non-linear corpuscular optics lens is  $2n$ -polar, where  $2n$  is an integer equal to at least 8.

5. Device according to claim 1, in which the scanning means include a pair of magnetic dipoles.

6. Device according to any one of claims 1 to 5, in which the charged hadron beam generation means comprise a synchrotron and the means for adjusting the energy of the generated charged hadrons are the means of adjusting the energy of the charged hadrons produced by this synchrotron.

7. Device according to any one of claims 1 to 5, in which the means of generation of the charged hadron beam comprise a cyclotron and the means of adjusting the energy of the generated charged hadrons include moment analysis means.

8. Device according to any one of claims 1 to 7, in which the corpuscular optics means are capable of varying the uniformisation of the transverse density of

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the charged hadron beam depending on the length and /  
or the width of the narrow band.

9. Device according to any one of claims 1 to 8,  
5 in which the scanning means are capable of making the  
charged hadron beam scan the target at predetermined  
depths of this target, a plurality of times for each of  
these depths, the dose delivered to the target each  
time being equal to the total dose required for this  
10 depth, divided by the number of times.

10. Device according to any one of claims 1 to 9,  
in which the charged hadrons are lightweight nuclei.

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